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**REPORT**

OF

**CHIGNECTO CANAL COMMISSION**

Part I—The Commission's findings

Part II—Surveys and estimates

Part III—Extent and scope of Commission's investigation



OTTAWA

J. O. PATENAUDE, I.S.O.

PRINTER TO THE KING'S MOST EXCELLENT MAJESTY

1939





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# REPORT OF CHIGNECTO CANAL COMMISSION

## PART I

Honourable R. J. MANION,  
Minister of Railways and Canals,  
Ottawa,

SIR,—

1. The undersigned Commissioners appointed to inquire into the Chignecto Canal proposals beg leave to report as follows:—

2. For the purpose of obtaining the necessary information to enable the government to determine whether the construction of the proposed canal should be proceeded with it was directed (Order in Council P.C. 1686, of July 21, 1931) that inquiry be made by the Commission "into the whole project from the standpoint of economic and national advantages or disadvantages that may accrue from the construction of the proposed canal, and as to the dimensions and location of same, which would best serve the economic and national interests of Canada, having in view the probable nature and extent of the traffic through the proposed canal."

### THE PROJECT FEASIBLE

3. As a result of our extended study we find that, physically, the project is feasible but that a canal with a continuous run from water to water would not be practicable, as the unequal tidal conditions on each side of the Isthmus of Chignecto would set up a current of scouring velocity and render canal navigation impossible. The water level of a run of water canal would, necessarily, vary greatly with the tide, and, while there would be no locks, the cost would still be greater than a canal with locks, owing largely to the additional excavation entailed. A canal with locks would, therefore, be required.

4. This raises the question of water supply for lockage purposes, as to which there is a deficiency along the summit level of the route declared by the engineers who conducted the present investigation in the field to be the most suitable for the location of a canal. To meet this unusual situation it would be necessary to provide for a pumping plant at the Baie Verte end, as water from the Bay of Fundy could not be used because of the silt which it carries. In the absence of hydro-electric power, usually a by-product of modern canal construction, recourse would require to be had to steam for the operation of the pumping plant.

5. Having regard to unusual conditions at Chignecto, it has been necessary to consider the relative advantages of a full-tide canal and a half-tide project. As will be seen from the estimates accompanying this project, the saving in cost as between a half-tide and a full-tide canal would not be sufficient to justify the construction of a half-tide project, especially when loss of time in awaiting entrance, which might be as much as six hours, is added to the unavoidable slowing down of all navigation using canals or the restricted channels and approaches thereto. Consequently, we feel that any consideration of the Chignecto project should be on the basis of a full-tide project.

6. We have given due consideration to the relative merits of the three possible locations for a canal between Cumberland Basin and Baie Verte, as to which differing views and opinions have been expressed in past recommenda-

tions, and we agree with the view entertained by the engineers who have conducted the present investigations in the field. Care has been taken in the present instance to determine the nature and depth of the overburden and the location of the rock where possible. In this way it has been definitely ascertained that the cheapest and most satisfactory route available would be that known as the Missiguash route.

7. As to depth of canal, various considerations are involved. For coastal services, and for the smaller type of ocean-going vessels, it would be sufficient to provide navigation comparable to that at the present St. Peter's Canal, in Cape Breton. There the depth is 18 feet, with bottom width of 70 feet, with lock 48 feet wide and 200 feet long. This is somewhat larger than the dimensions of the limiting locks on the present St. Lawrence canals, which have a length of 270 feet, a width of 45 feet 3 inches, and a depth of water of 14 feet over the mitre sills. They accommodate vessels up to 255 feet over-all length.

8. To provide a canal at Chignecto capable of accommodating the same class and type of shipping as makes use of the aforementioned St. Peter's Canal, with two locks, passing basins at three-mile intervals with a bottom width of 100 feet, would, we find, cost \$23,045,000. A larger canal of 25 feet depth, 120 feet bottom width, with two locks, each 60 feet wide and 500 feet long between hollow quoins; with passing basins at three-mile intervals, with a bottom width of 200 feet, could be provided at an estimated cost of \$38,553,000, or 15 millions more than the cost of the smaller canal. The larger canal would be capable of passing vessels of the type now engaged in the Bay of Fundy gypsum trade, as well as the passenger and freight vessels now engaged in the Canadian West Indies service and now passing from the Gulf of St. Lawrence into the Atlantic by way of the Gut of Canso.

9. The annual charges on canals of the foregoing dimensions—interest on capital cost at 5 per cent, depreciation at one-half of one per cent, and maintenance and repairs, and operation—on the smaller project are estimated at \$1,804,200, and on the larger at \$2,762,400. In arriving at these charges, 10 per cent is added to capital cost to cover interest during construction.

Detailed estimates of costs of eleven possible projects examined, including the two types of canals referred to in paragraphs 7, 8 and 9, will be found set out in Appendix No. 1, signed by Mr. D. W. McLachlan and Mr. Guy A. Lindsay, of the engineering staff of the Department of Railways and Canals.

## NAVIGATION IN THE BAY OF FUNDY

10. As directed, we inquired closely as to what particular dangers, if any, there would be to navigation in the Bay of Fundy which might affect the operation of vessels through the proposed canal.

11. With modern aids to navigation we would not consider the navigation of the Bay of Fundy to be subject to any particular difficulty. The fog study incorporated in our report and the statement of fog percentages, based on twenty years of observation, indicate that Bay of Fundy waters are subject to rather less fog than is to be found on the Atlantic shore of Nova Scotia.

12. It is true that the Bay of Fundy is subject to unusually strong tides, especially in the fall of the year, but with full-powered vessels this should present no more difficulty at Chignecto than it does at the present time for vessels entering Minas Basin to load apples or gypsum. These tidal conditions present accepted practical difficulties such as the necessity to enter and leave a port at certain stages of the tide, and also impose the necessity that vessels lie aground at dock between tides. That difficulty would not attend the provision

of a full-tide canal at Chignecto, so far as the use of the canal itself is concerned. We would, however, hesitate to endorse the suggestion that the upper waters of the Bay of Fundy would prove attractive as a liner route.

## ECONOMICS OF THE CHIGNECTO PROPOSALS

13. For the information of this Commission a very complete study of the economics of the Chignecto proposal was made by Mr. Guy A. Lindsay, of the St. Lawrence Waterway engineering staff of the Department of Railways and Canals, who is well qualified by training and experience to analyse the engineering, transportation, and general economic considerations involved in the project. This study, and the tables and appendices referred to therein, will be filed as Appendix 3 to this report.

14. In that study information is supplied as to sailing distances between Montreal and Bay of Fundy points, and the principal maritime centres interested in Eastern Canadian trade. These include the United States Atlantic ports of Portland, Boston and New York; Cuba and the West Indies, Bermuda and Liverpool, and the statement sets up in comparative form the distance in statute miles via Cabot Strait, via the Gut of Canso, and via Chignecto. The factor of distance alone is, however, not an absolute criterion, as, in the consideration of alternative routes, the time consumed in navigation is of equal importance to that of saving in distance, and it is only when time of navigation is reduced to terms of equivalent distance that a correct estimate of relative advantages is to be had. The necessity to approach carefully and traverse a canal with locks and restricted channels consumes time which in the open sea would, under normal conditions, be utilized for steaming at full speed. In that connection an estimate is given of the time in days required for the navigation of existing routes and the time required by way of the proposed Chignecto Canal. From this it will be seen that in certain cases the canal would offer little advantage, and in some cases none whatever, in point of time when the delay incident to the use of a canal is taken into account. However, to reach northern United States ports from Prince Edward Island and mainland points adjacent to the canal, and between Saint John and other Fundy ports and Montreal there is an advantage in both time and distance, which, translated into estimated savings in transportation costs per ton will be found set out in Mr. Lindsay's report.

15. In order to determine the possible economic value of the project an earnest effort has been made to estimate the probable amount of traffic which would be attracted to the route by reason of the establishment of a canal at Chignecto. From data appearing in the appendix referred to in paragraph 13 it would appear, roughly, that the estimated saving in transportation costs would amount to 8 cents a ton for a vessel of 2,400 tons, on a draft of 14·2 feet, and 6 cents a ton for an 8,500-ton vessel on a 24-foot draft. Applying this estimate to the two canals of the dimensions already referred to, viz., of 18 feet draft and 25 feet draft, it was ascertained that to balance the annual charges the traffic would have to exceed greatly the maximum annual capacity of the canal.

16. One method of computation involved an estimate of all tonnage in and out of St. Lawrence river ports, from and to United States ports, and similar information as to Bay of Fundy ports and the port of Saint John, exclusive of winter shipments. The purely coastwise traffic was also taken into account. By this method it was estimated that, with a canal 25 feet deep, a total annual saving in transportation costs, amounting to \$370,000, might be expected, and with a canal 18 feet deep a saving of \$487,000. These annual savings would be about 15 per cent and 30 per cent respectively of the annual charges on the two canals.



17. The foregoing estimate is much greater than that arrived at by analysis of possible traffic via the canal, based upon present carriage of commodities by water, and probable increase. In that analysis, which is incorporated in Appendix III, every effort has been made to approximate fairly the present movement by water and the likely effect of the project upon that movement. As a result it is regarded as possible that a traffic of 1,804,000 tons annually might be expected for a 25-foot canal and a traffic of 1,194,000 tons for a canal of 18-foot depth. On the basis of the estimated savings in transportation costs (paragraph 15) applied to the various commodities dealt with by Mr. Lindsay in Appendix III, a total annual saving of \$127,490 might be regarded as possible with a canal of 25-foot depth and of \$129,490 with a canal of 18 feet.

18. This estimate relates only to savings effected by shipments through the proposed canal compared with shipments by present water routes. It may be claimed that this is not a fair comparison as most of the traffic moves by rail at the present time. If the saving effected by shipments through the proposed canal as against rail shipments is greater than by the method of analysis used, then a saving could be effected by use of the water routes available at the present time. We cannot see any great stimulation of water-borne commerce as a result of the construction of the canal, and are of opinion that the best that could be hoped for would be rather a redistribution of certain present movements in the area immediately tributary to the canal.

### THE CANAL AND THE RAILWAYS

19. If the volume of traffic estimated as available for transit through the proposed canal, actually moved by water, it would mean a diversion of some traffic from the railways. As the savings figured in the foregoing estimate are based on actual costs, no account is taken of the loss in revenue to railways due to this diversion of traffic. When the Commission sat at Moncton, the administrative centre of the government railways in the maritime provinces, the opinion was expressed by Senator Robinson that the canal would not be a competitor of the Canadian National Railways because the transportation provided would be for a class of commodities which could not use the railways because of prohibitive freight rates. On the other hand, it was Senator Robinson's opinion that the development of the country generally as a result of providing adequate water transportation facilities would beneficially affect the railways, for eventually that development would create more traffic for the railways.

20. That, however, is not the case presented to the Commission in Prince Edward Island, where witnesses appearing on behalf of such primary industries as agriculture and the fisheries advocated the canal because of the cheap transportation it might be expected to afford by contrast with present railway rates. It was stated that since the provision of the train-ferry connection with the mainland (at a capital cost of \$6,988,835) local transportation conditions had so far improved that Island farmers now realize as much for their export potatoes as do their mainland neighbours. The Commission was informed that the potato growers of Prince Edward Island realized \$1,000,000 less a year for their potatoes in the five years prior to the institution of the car-ferry service, in 1914, than did their Nova Scotia neighbours. In 1930, with a 33 per cent increase in production, the value of the island crop was \$2,000,000 more than the sum realized before the train-ferry service was provided. Nevertheless, it was represented to the Commission that a saving of \$626,592 annually in freight rates on potatoes and turnips could be expected if a canal made it possible to ship by water produce now going out by rail.

21. As advocates of the canal regard it as a means of escaping what are felt to be onerous freight rates it is beside the question to say that the canal cannot be regarded as a traffic competitor of the railways. If it is not to compete with the railways, and, in doing so effect a substantial reduction in transportation costs, then the argument largely put forward in support of the proposition fails. On the other hand, if it is to be viewed merely as a stimulus to the present water transport, as affording direct connection between the waters of the Gulf of St. Lawrence and the Bay of Fundy, then it is open to the objection that the amount of traffic affected and the interests to be served do not justify the expenditure involved. Among shipping men themselves there is a decided difference of opinion as to the value of the project, those in the coastal trade hailing the proposed canal as a boon, and those interested in the through business and established connections preferring present lines of communication.

22. Although invited to do so if desired, the railways have made no representations in the matter. Possibly they feel that present railway conditions speak for themselves. The Canadian National lines would be principally affected should there be any great diversion of traffic through the canal, though the Canadian Pacific would also be concerned in the Montreal-Saint John business. Any additional loss of traffic is a matter of serious consequence to the railways. The taxpayers of Canada as a whole are carrying a very heavy burden in that respect at the present time. Revenue freight traffic on Canadian National Railways, Eastern Lines, has dropped from 7,224,675 tons in 1929 to 3,828,583 tons in 1932, while the revenue from freight declined from \$18,544,520 to \$11,705,947 during the same period. During 1932 railways in the maritime area were paid \$1,922,073 to compensate for the 20 per cent reduction in freight revenues authorized by the Maritime Freight Rates Act. During 1932, also, the Government paid over to the Canadian National Railways, in the territory covered by the same Act, \$6,635,844 on deficit account. Since the Maritime Freight Rates Act became effective, July 1, 1927, a total of \$48,202,783 has been paid by the government to the railways east of Lewis, of which sum \$15,296,999 has been on rate reduction account and \$32,905,783 on deficit account. These items from official records are highly significant of the present unsatisfactory position of the railways. They speak eloquently also of the efforts made by present and previous governments to provide railway services to the Maritime Provinces at less than cost.

## CHIGNECTO AND THE ST. LAWRENCE

23. As regards the claim that a canal at Chignecto ought to be provided in view of Canada's great outlay and annual charge in connection with canals generally, very little of it in the maritime area, it should be borne in mind that in the case of our great inland waterway there has been no alternative, and the St. Lawrence canals, the Welland and the Sault Ste. Marie canals are all part of the only navigation route leading to the heart of the continent. The advantages of those improvements to navigation are not local, but redound to the benefit of Canada as a whole, including the maritimes. Canada could not progress without the improved waterway connecting the Great Lakes and the Atlantic Ocean.

24. What this through route to and from the interior means in terms of transportation costs may be realized by assuming the waterway to be non-existent and that all grain moving to Montreal had to be brought from the Head of the Lakes by rail. During the 1932 season of navigation 2,710,894 tons, or 90,363,133 bushels, of wheat passed through the St. Lawrence canals. The average rate from Fort William to Montreal by water was 5.09 cents per bushel, or

8.48 cents per 100 pounds, and the cost of movement was, therefore, \$4,599,484. The rail rate from Fort William to Montreal was 34½ cents a hundred pounds, or 20.7 cents a bushel. By rail the movement would have cost \$18,705,168, or \$14,105,684 more than was paid for the water movement.

25. Canada's capital investment in the St. Lawrence-Great Lakes canal system, the through navigation route, is \$210,732,453. This includes expenditures on canals no longer used for navigation, such as the original Beauharnois and the recently abandoned Welland Canal, which has been superseded by the Welland Ship Canal. If to the capital sum be added the cost of heavy repairs and alterations, the cost of ordinary repairs and maintenance, and the cost of operation, the total is found to be \$259,117,027. From this should be deducted canal revenues totalling \$29,143,048 (hydraulic and other rentals, wharfage, elevator fees, etc.). If on the resultant net expenditure of \$229,973,979 interest at 5 per cent is computed the carrying charge to the Dominion on St. Lawrence-Great Lakes canal account may be said to be \$11,498,698 annually, or \$2,606,986 less than the saving in the movement of wheat alone, last season, through the canals to Montreal as contrasted with the cost of a similar movement by rail.

26. Conditions at Chignecto, however, are not akin to those obtaining in the St. Lawrence-Great Lakes area. As all points on the Gulf of St. Lawrence and on the Bay of Fundy have natural access to the sea the question is entirely one of shorter communications. In the case of the Great Lakes, the canals are a national necessity; in the case of Chignecto a canal would simply be a refinement of present facilities and largely of local significance. It would afford Prince Edward Island more direct access to the port of Saint John, and certain North Atlantic United States ports; and provide the port of Saint John with a shorter and more direct route to Prince Edward Island and to Montreal. As a through maritime highway, it would not likely be attractive to shipping, in view of the preferable navigation conditions in more open waters. In that connection too much weight ought not to be ascribed to distance. In the case of canals and restricted navigation, time is equivalent to distance, and close analysis of these factors is found to neutralize much of the supposititious advantage of the shorter Chignecto route.

### GENERAL CONSIDERATIONS

27. Considering the proposal from the standpoint of local economic advantage, the Commission fails to see what benefit it would be to the districts concerned to provide, at such great cost, a navigation facility which would intensify competition in the localities served, rather than lessen it. Certain natural resources such as lumber, coal and gypsum, and certain agricultural products common to Prince Edward Island and New Brunswick at the present time enjoy trading outlets via the Gulf of St. Lawrence, or via the Bay of Fundy, as the case may be. These commodities are available on both sides of the Isthmus of Chignecto, and it seems to us that no useful end would be served by making it possible, at such heavy charge, for certain interests to the south of the canal to compete more strongly with certain similar interests to the north of the canal, and vice versa. Instead, the present division of trade might well be regarded as a geographic rationalization of maritime business, to disturb which could promise no advantage at this time, and even if the desired change were effected, it is a question whether the results would prove anything like as satisfactory as has been imagined.

28. We do not believe that a canal at Chignecto would have any bearing whatever upon Canada-West Indies trade, as it would offer no advantage in that direction from the standpoint of either time or mileage, neither do we feel that it is a project as to which the co-operation of the United States could be expected.



29. The effect of the proposed canal upon the Gulf Fisheries is dealt with at length in our presentation of the traffic aspect of the proposed work. We are assured by officials of the Department of Fisheries that the provision of a canal would not alter conditions in the waters, and would have no detrimental effect upon fish life on either side of the Isthmus.

## POSSIBILITIES OF WATER POWER DEVELOPMENT

30. Our terms of reference require us to deal with the possibilities of developing water power "along the proposed canal." There are no possibilities of that nature along the route of the proposed canal where, on the location preferred by the engineers who conducted the present investigation, there is an insufficient supply of water for lockage purposes. It was, however, suggested to the Commission in the course of its inquiry that a combined navigation and power scheme might be made possible by the harnessing of the tides of the Bay of Fundy. We, therefore, had this possibility explored by engineers of the Department of Railways and Canals conversant with canal matters and hydro-electrical power developments (See Appendix No. 2, signed by Mr. D. W. McLachlan and Mr. Guy A. Lindsay), as a result of which it is found that the estimated total cost of navigation and tidal power combined in one project (\$72,185,000) would be about \$8,000,000 more than the total cost of a navigation project alone along the Missiguash route (\$39,265,000), plus the total cost of tidal power alone (\$25,041,000). As there would be no economy in attempting to combine a navigation and a tidal power project we feel that any proposed combination of the two projects would serve no useful purpose. We pass no opinion on the feasibility of any tidal power project as such but, as a result of engineering advice and information available, are of opinion that it would be inadvisable to attempt to combine the two proposals. Subject to the approval of the Dominion, which exercises jurisdiction in tidal waters, and subject also to the safeguarding of the paramount rights of navigation, it would be possible, should the development of tidal power on a commercial scale become a practical proposition for the provinces concerned, or for private interests, if authorized to proceed with a tidal power development in the upper Fundy area independently of the canal project.

31. The foregoing references deal in a general way with the points enumerated in Schedule A of the Order in Council of July 21, 1931 (P.C. 1686), which constituted our terms of reference. This schedule appears in part three of this report, together with a digest of the recorded proceedings of the Commission.

32. In the course of its inquiry the Commission failed to discover any pronounced or general demand for the construction of the canal, though every effort was made to arrive at a just estimate of prevailing public opinion in the Maritimes. The sittings of the Commission were not largely attended and the interest displayed in the inquiry was not extensive. This may have been due to a recognition of the economic situation and the difficulties attending the consideration of such a project at this time. However, having regard to the facts as ascertained, this Commission is strongly of opinion that the proposal to construct a canal at Chignecto offers no national or local advantages at all commensurate with the estimated outlay. This would be our opinion even were economic conditions not what they are at present, but, in view of prevailing financial conditions, we are confirmed and strengthened in our belief that it would be unwise to embark upon such an undertaking. Having regard to transport facilities already available in the maritime area as a whole, we cannot see where any interest would suffer were the Chignecto Canal project to be permitted to stand in abeyance until it can be further examined in the light of future developments in Canada's economic situation.

## COMMISSIONER ROBB'S DISSENT

33. While subscribing in general to the report as herein presented, Commissioner Robb wishes it understood that he does not concur in the findings of the engineers and of his fellow commissioners as to the Minudie-la Planche route. Having had special opportunities to examine not only the previous engineering reports, but to look into the physical features closely as a life-long resident of the locality, he is of opinion that the Minudie-La Planche route would have considerable advantages over the Missiguash route recommended by the engineers and endorsed by his fellow commissioners. In Mr. Robb's belief those advantages would be as follows:—

1. By including the Hebert, Maccan and Nappan Rivers, sufficient water would be supplied for lockage purposes and save the cost of the proposed pumping plant.
2. The inlet of the Canal would be of cleaner water.
3. Would form a better and safer entrance for ships.
4. Would call for less excavation.
5. Would form a large basin to float ships at all times of tide.
6. Would provide a shorter and more direct entrance and outlet for ships.
7. Would afford a more direct route for the canal from the Bay of Fundy to Baie Verte.

It is his belief that a canal on the Minudie-La Planche route could be built for much less than the present estimate, and he recommends that there be no commitment to construction upon the Missiguash route until opportunity has been afforded for a further engineering examination and a more extended consideration of the Minudie-La Planche project.

34. In concluding its report, the Commission desires to place on record its sincere appreciation of the services of the Secretary, Mr. George W. Yates, Assistant Deputy Minister, Department of Railways and Canals, as well as of the assistance so freely rendered at the various stages of the inquiry by Mr. D. W. McLachlan, Mr. Guy A. Lindsay, and Mr. Russell Yuill, of the engineering staff of the department. The Commissioners found these public servants anxious at all times to be of assistance. In their respective spheres they have been most helpful, and for their co-operation the Commissioners are greatly obliged.

ARTHUR SURVEYER,  
*Chairman.*

DAVID W. ROBB.  
JOHN F. SOWARDS.

GEO. W. YATES,  
*Secretary.*

OTTAWA, November 9, 1933.

## PART II

### HISTORICAL SUMMARY

As will be seen from the accompanying map, the Isthmus of Chignecto consists of a narrow strip of land, about twenty miles in width, which separates the head waters of the Bay of Fundy, at Cumberland Basin, from the waters of the Gulf of St. Lawrence, at Northumberland Strait, beyond which lies the picturesque province of Prince Edward Island. The Isthmus of Chignecto not only divides the waters referred to, but across its restricted area runs the boundary line between the provinces of Nova Scotia and New Brunswick. Its sheltered and at the same time strategic position gave Chignecto considerable importance in the days of the French regime and subsequently, both as a commercial route between the two waters, and as a military base. These various activities were assisted by several small rivers draining in both directions, and by a series of hills and ridges upon which at appropriate points, forts were constructed which were the scene of important encounters during the period in the middle of the eighteenth century when the rival contending forces of France and Britain were engaged in the struggle that decided the destiny of Acadia. It is, therefore, historic ground.

With the establishment of settled government and the opening up of the country generally, the importance of Chignecto in a military sense declined, but its possibilities as a commercial route have never been lost sight of. In consequence, for more than a hundred years, dating back to the period when water transport was the chief reliance of the country, and coastal services most important for the movement of local traffic, the feasibility of canal communication across the Isthmus of Chignecto has been studied with a view to the establishment of direct and sheltered connection between St. Lawrence and Bay of Fundy and Eastern United States ports, to the avoidance of the more circuitous outside passage around the Atlantic coast of Nova Scotia.

### SURVEYS PRIOR TO CONFEDERATION

Prior to Confederation there had been several surveys and engineering investigations of the possibilities of the project. In 1822, Robert C. Minitte, C.E., acting under instructions from the government of New Brunswick, and on behalf of a committee of citizens of Saint John, surveyed a line through the valley of Aulac, across to Missiguash Lakes, and thence to River Tidnish. On this occasion the committee reported in favour of a four-foot canal project, to be fed by fresh water.

In 1825, Francis Hall, C.E., under instructions from the Lieutenant-Governor of New Brunswick, reviewed the Minitte report, and also explored the possibility of alternate locations between Shediac and the Petitcodiac and Memramcook rivers, in the end recommending an eight-foot waterway on the Minitte location at an estimated cost of \$298,000. The information thus secured was submitted by the Province of New Brunswick to Thomas Telford, C.E., an outstanding British engineering authority, who, in 1826, confirmed the previous findings but recommended increasing the depth to thirteen feet, bringing the estimated cost to \$685,952.

It was not until 1843 that further consideration was given the matter. In that year, Captain H. O. Crawley, R.E., who had been commissioned jointly by the governments of Canada, New Brunswick and Prince Edward Island to



review the reports and recommendations of 1825 and 1826, reported that a depth of nine feet on the lock sills would be sufficient, but that the proposal was impracticable owing to the lack of a fresh water supply for the operation of the locks, and he objected to the use of the silt-laden water of the Bay of Fundy to supplement the deficiency.

## SURVEYS AND INQUIRIES FOLLOWING CONFEDERATION

Although the province of Nova Scotia passed an act which would have permitted the construction of the work as a private undertaking, and a local company was incorporated for the purpose, the idea was dropped and the project again lay dormant until revived by the Confederation of the several Canadian provinces in 1867.

In the following year the newly-established Senate and Commons of Canada adopted an address to His Excellency the Governor General praying that all the information in the hands of the local governments be submitted to the Minister of Public Works for report. In consequence, a report was made by John Page, Chief Engineer of Dominion Public Works, in 1869, upon the previous surveys. He was of opinion that an abundant supply of fresh water could be obtained by adopting a lower level than the one previously recommended, or at an elevation of from ten to twelve feet below the level of the highest tides of Cumberland Basin, where the waters of the Bay of Fundy should be kept back by a lock at the western end of the canal. At the same time, he recommended further surveys and examinations.

In 1870, the first parliament of Canada, under Sir John A. Macdonald, instituted a comprehensive inquiry by Royal Commission into the state of the canals and allied public works which, under the terms of Confederation, had been transferred to the Dominion from the jurisdiction of the provinces. Included within the scope of this inquiry were twelve different projects. At the head of this list was placed the possible enlargement of the Welland Canal. Next in order was placed the enlargement of the St. Lawrence canals and the deepening of the interconnecting channels. The deepening of the St. Lawrence channel between Montreal and Quebec followed, and at the foot of the list were enumerated several proposed new projects for consideration, including:—

“12th. The construction of a canal through the Isthmus dividing the Bay of Fundy from the Gulf of St. Lawrence at Bay Verte.”

In 1871, this Canal Commission reported, dividing its recommendations into works of the first class, and works of the second, third and fourth classes.

“In the first class we have placed all those works which it is for the general interest of the Dominion should be undertaken and proceeded with as fast as the means at the disposal of the government will warrant.”

Included in the works of the first class were the construction of the Sault Ste. Marie Canal, the enlargement of the Welland and the St. Lawrence canals, the improvement of the Ottawa river between Ottawa and Lachine, the deepening of the lower St. Lawrence ship channel and the construction of the Bay Verte canal, with locks 270 feet in length, 40 feet in width, and with 15 feet draught of water on the mitre sills. The estimated cost was placed at \$3,250,000. The Commissioners added:—

“We consider that all the works embraced under the head of first class are really of so great importance, so essential to the welfare and prosperity of the whole country, that we feel some degree of embarrassment in recommending which of them should be first proceeded with, but we respectfully suggest that they should be undertaken in the order in which they are here recited, or as far as possible, simultaneously.”

In 1872, further consideration was given the Chignecto (or Bay Verte) proposals. G. F. Baillairgé, Assistant Chief Engineer of Dominion Public Works, after examining various routes, recommended the construction on the Aulac-Tidnish line, of a full-tide canal of the dimensions proposed by the Canal Commission.

During the same year (1872) Messrs. Keefer and Gzowski, the foremost engineering authorities of the day, reviewed the Baillairgé report, advising certain modifications and changes. In the following year these two engineers recommended a half-tide canal, via the La Planche route. This project had the disadvantage of not being susceptible of eventual extension to a full-tide canal, i.e., a canal available for use at any and all stages of tide. The recommendations of these eminent gentlemen were in turn reviewed by Mr. Baillairgé (November, 1873), who once more recommended the Aulac-Tidnish line, via the Missiguash Valley, with the use of the Aulac and Missiguash rivers as reservoirs.

On Mr. Page, the Chief Engineer of Public Works, fell the responsibility of decision, and he disposed of the matter by condemning the Keefer-Gzowski proposals and approving in general the Baillairgé report, at the same time submitting the following estimates of the cost of a canal on the Aulac-Tidnish line, via Missiguash Valley:—

For a half-tide canal .....	\$7,700,000
Three-quarter-tide .....	8,100,000
Full-tide .....	8,500,000

By this time the Government of Sir John A. Macdonald had given way to the ministry of Honourable Alexander Mackenzie and, in 1875, the latter government appointed a commission of four members, representative of the provinces of Quebec, Ontario, New Brunswick and Nova Scotia, to investigate the nature and extent of the commercial advantages to be derived from the construction of the Chignecto Canal, and, in the following year, the majority commissioners reported that they had no hesitation in expressing their opinion that it was not in the interest of the Dominion that the proposed canal be constructed. In that opinion, one commissioner, representing the province of New Brunswick, dissented, and put in a minority report strongly favouring the project.

The completion, in 1876, of the Intercolonial Railway provided the Maritime Provinces with quick access to upper Canadian points at all seasons of the year and, with this outlet established, the immediate demand for the prosecution of the local canal project lessened appreciably. It was revived in 1882 in another form, when a private company was incorporated for the purpose of building a marine or ship railway across the Isthmus, at an estimated cost of \$4,350,000, and an Order in Council was passed authorizing a subsidy of \$150,000 a year for twenty-five years on certain conditions. Work was prosecuted on this project for some years, with several interruptions due to financial difficulties. In consequence of these, the subsidy lapsed, and, following the defeat of the Tupper administration and the accession of the Laurier Government in 1896, a sub-committee of Council reported (January 27, 1898) that they were "of opinion that the scheme cannot be regarded as one of such public utility as would warrant an application to be made to Parliament for a renewal of the lapsed subsidy." Although strong pressure was brought to bear on behalf of British bond and shareholders for compensation in the sum of \$1,500,000, the claim was never recognized, nor the subsidy rights renewed. Finally, in 1902, the government paid the company \$105,391.63 for certain rails and fastenings which were taken over by the Intercolonial Railway, and

all that now remains of this marine railway venture is a well-defined right of way marked in places by substantial stone culverts—a monument to the unrequited efforts of the promoters of an ill-starred enterprise.

## RECENT SURVEYS AND ESTIMATES

The failure of the ship railway project was followed by another lengthy period of inaction with respect to the canal proposal, though local interest continued. This led to the revival of the proposal in Parliament in the session of 1929 when the House of Commons adopted the following resolution:—

Resolved, that in the opinion of this House, it is advisable that the government of Canada take immediate steps to further investigate said project as to feasibility, cost of construction, economic and national advantages to be gained by the construction of a ship canal across the Isthmus of Chignecto to connect the waters of the Bay of Fundy with the waters of the Gulf of St. Lawrence and further that the government be urged to make these surveys and investigations with the least possible delay.

In consequence, engineers of the Department of Railways and Canals were instructed to undertake surveys and borings with a view to the preparation of estimates of the probable cost of the construction of a canal of any definite dimensions and on any definite location across the Isthmus, and to prepare and furnish plans for such construction. To this end all the plans and data on the subject available were assembled, and a program of surveys laid out in order to complete the information on which to base estimates of cost.

These estimates have been based upon the following unit prices:—

Excavation—Peat . . . . .	\$ 0.20 per cubic yard
Alluvial clay . . . . .	0.26 “ “ “
Sand and gravel . . . . .	0.60 “ “ “
Dry rock . . . . .	2.00 “ “ “
Submarine rock . . . . .	5.00 “ “ “
Dykes —Earth fill . . . . .	0.40 “ “ “
Rip rap . . . . .	3.00 “ “ “
Concrete —Mass . . . . .	12.00 “ “ “
Cribwork . . . . .	6.00 “ “ “

The three routes most seriously considered in the previous reports—i.e., the Missiguash, La Planche and Aulac routes—were examined, and traverses and levels were run over the first two lines, and borings made over all three. A plan showing the location of these possible projects accompanies this report.

## MISSIGUASH ROUTE

This is the route recommended by John Page, Chief Engineer of Public Works, and G. F. Baillairgé, Assistant Chief Engineer, in 1873.

### *Project No. 1, Estimate No. 1*

This project is for a run from water to water canal, that is a canal without locks; 25 feet deep, 120 feet bottom width, and available at all stages of the tide. The estimated cost is \$55,595,000. Not only is the estimated cost of such a project much greater than for a canal of the same size with locks, but the physical features of such a project render it impracticable.

Mean sea level in both Cumberland Basin and Baie Verte is at approximately the same elevation, viz., elevation 70·80. In Cumberland Basin, on the Fundy side, the average maximum high tide is at elevation 94·08 and the average minimum low tide, elevation 48·26—giving a range of about 46 feet. Similar levels in Baie Verte, on the Strait of Northumberland, are from 75·75 to 67·85—a range of about 8 feet.



Under such varying tidal conditions, with a run from water to water canal, the maximum velocity set up would be more than 19 feet per second, which is much greater than scouring velocity, as well as being prohibitive for navigation.

*Project No. 2, Estimate No. 2*

This project is similar to Project No. 1, except that a lock is introduced at the entrance to the canal at Cumberland Basin. The water level above this lock would be that in Baie Verte and would vary during an average spring tide from about elev. 75 to 67. The estimated cost of this project is \$55,484,000. This is also much greater than for a canal with two locks, with a raised canal reach.

*Project No. 3, Estimate No. 3*

This project is for a canal 25 feet deep, 120 feet bottom width, available at all stages of the tide. The main features of this project are as follows:—

- (a) an entrance channel, 5.6 miles long, 450 feet bottom width, 25 feet deep below low water, from deep water in Cumberland Basin to a lock situated on the shore about 3,000 feet south of the mouth of the Aulac river.
- (b) a lock on the shore of Cumberland Basin, 60 feet wide and 500 feet between hollow quoins. The water level in the reach above this lock is to be held to elevation 86 to 88. As this is below the elevation of high tide in Cumberland Basin the lock has to be capable of both raising and lowering vessels into the canal.
- (c) a canal, 18 miles long, 25 feet deep, and 120 feet wide on the bottom. Passing basins with mooring platforms are provided at about 3-mile intervals, giving a clear bottom width of 200 feet.

The water level in this canal reach is to be held to elevation 86 to 88. This elevation is below the general water plane in the surrounding marshes.

- (d) a second lock of the same dimensions as that at Cumberland Basin, about 3,000 feet inland from the shore at Baie Verte near Tidnish Head. The water level in Baie Verte will be below the level in the canal reach at all stages of tide.
- (e) an entrance channel, 8.4 miles long, 450 feet bottom width, 25 feet deep below low water, from the Baie Verte lock to deep water in Baie Verte.
- (f) a pumping plant at the Baie Verte end of the canal. This is necessary in order to obtain a sufficient supply of water for lockages. Capacity is provided for 130 cubic feet per second which is sufficient to supply 5 lockages each way per day, plus evaporation.

The estimated first cost of this project is \$38,553,000. In comparing this figure with the cost of Projects Nos. 1 or 2, the capitalized cost of operation, maintenance, etc., of the pumping plant, amounting to \$712,000, should be added. This gives a total cost of \$39,265,000.

The additional cost if the canal reach is made 200 feet wide on the bottom is estimated at \$3,936,000.

The additional cost if the lock chambers are made 859 feet by 80 feet, as on the Welland Ship Canal, is estimated at \$4,777,000.

*Project No. 4, Estimate No. 4*

This project is the same as Project No. 3, except that the Cumberland Basin entrance is available only when the water level is above half tide—i.e., above elevation 70.

This restriction reduces the cost of the excavation in the entrance channel in Cumberland Basin, and also reduces the cost of the Cumberland Basin lock and the cost of the water supply.

The estimated first cost of this project is \$34,014,000. The addition of the capitalized cost of operation, maintenance, etc., of the pumping plant brings the total to \$34,542,000.

The additional cost if the canal reach is made 200 feet wide on the bottom is estimated at \$3,936,000.

The additional cost if the lock chambers are made 859 feet by 80 feet is estimated at \$3,627,000.

*Project No. 5, Estimate No. 5*

This project is for a canal 16 feet deep, 100 feet bottom width, available at all stages of the tide. The locks are the same size, viz., 500 feet by 60 feet as in Projects Nos. 3 and 4. The entrance channels are the same, i.e., 450 feet wide, but due to the decrease in depth, the length of the channel in Cumberland Basin is only 4 miles long, and that in Baie Verte 2.5 miles.

The estimated first cost of this project is \$24,699,000.

*Project No. 6, Estimate No. 6*

This project is the same as Project No. 5, except that the entrance at Cumberland Basin is available only when the water level is above half tide.

The estimated first cost of this project is \$21,913,000.

*Project No. 7, Estimate No. 7*

This project provides for navigation comparable to that at the St. Peter's Canal in Cape Breton.

Entrance channels are made 300 feet wide, locks 300 feet by 48 feet, and the bottom width in the canal reach is made 70 feet. The depth provided at all stages of the tide is 18 feet.

The estimated first cost of this project is \$23,045,000.

*Project No. 8, Estimate No. 8*

This project is similar to Project No. 7, except that the entrance at Cumberland Basin is available only when the water level is above half tide.

The estimated first cost of this project is \$20,469,000.

#### GENERAL

One railway bridge and two highway bridges are required on the Missiguash route.

The main line of the Canadian National Railway crosses the canal about 0.9 mile above the Cumberland Basin lock. In order to place the crossing at right angles to the canal, the railway would require to be diverted for about 1.8 miles.

The Amherst-Sackville highway crosses the canal about three miles above the Cumberland Basin Lock.

The Baie Verte road crosses the canal 1.6 miles above the Baie Verte lock. It would be necessary to straighten out this road at the crossing and place the bridge about 500 feet east of the present road.

Lift bridges, giving vertical clearance to 120 feet, are provided in all these estimates.

## LA PLANCHE ROUTE

The La Planche route is the one recommended by Messrs. Keefer and Gzowski, in 1873.

The canal leaves Cumberland Basin at the mouth of the La Planche river and joins the Missiguash route about three miles above the Baie Verte lock. Detailed estimates of the cost of the two projects estimated will be found summarized in a table accompanying this portion of the report.

*Project No. 9, Estimate No. 9*

This project is for a canal with similar dimensions as Project No. 3, on the Missiguash route.

The entrance channel in Cumberland Basin is 8.5 miles long compared with 5.6 miles long via the Missiguash route.

The distance between the locks is 16.6 miles compared with 18 miles via the Missiguash route.

The estimated first cost of this project is \$51,281,000. This is approximately \$12,700,000 greater than the estimated cost of a similar canal on the Missiguash route, i.e., Project No. 3.

*Project No. 10, Estimate No. 10*

This project is the same as Project No. 9, except that the entrance at Cumberland Basin is available only when the water level is above half tide.

The estimated first cost of this project is \$40,489,000. This is approximately \$6,500,000 greater than the estimated cost of a similar canal on the Missiguash route, as provided by Project No. 4.

## GENERAL

The same number of bridges are required on this route as on the Missiguash route, viz., one railway and two highway. Lift bridges giving 120 feet of vertical clearance are provided.

As the costs of Projects 9 and 10 are so much greater than for canals of similar dimensions via the Missiguash route, estimates have not been prepared for canals of other dimensions on the La Planche line.

## AULAC ROUTE

This is the route recommended by G. F. Baillairgé in 1872.

The entrance to the canal from Cumberland Basin is at approximately the same location as for the Missiguash route. From this point the canal follows the valley of the Aulac river for about 8 miles, then turns east to join the Missiguash route about 8 miles from Baie Verte.

*Project No. 11, Estimate No. 11*

This project is for a full-tide canal of the same dimensions as Project No. 3, on the Missiguash route.

The total length of the canal between the locks is 18 miles, the same as on the Missiguash route.

The estimated first cost of this project is \$42,871,000. This is approximately \$4,300,000 greater than the estimated cost of a similar canal on the Missiguash route, i.e., Project No. 3.

One railway bridge and four highway bridges would be required on this route.

A summarization of the estimated cost of construction of these 11 possible projects, and of the physical dimensions of the same, will be found in the adjoining table:—



## CHIGNECTO CANAL SUMMARY OF ESTIMATES

Estimate No.	MISSISSAUGA ROUTE								LA PLANCHE ROUTE		ATLAC ROUTE
	1	2	3	4	5	6	7	8	9	10	11
Tide.....	Full	Full	Full	Half	Full	Half	Full	Half	Full	Half	Full
W.L.—Canal Reach.....	77'-6-65-6	88'-0-86-0	88'-0-86-0	88'-0-86-0	88'-0-86-0	88'-0-86-0	88'-0-86-0	88'-0-86-0	88'-0-86-0	88'-0-86-0	88'-0-86-0
Depth.....	25 ft.	25 ft.	25 ft.	25 ft.	10 ft.	10 ft.	18 ft.	18 ft.	25 ft.	25 ft.	25 ft.
Width—Entrance.....	450 ft.	450 ft.	450 ft.	450 ft.	450 ft.	450 ft.	300 ft.	300 ft.	450 ft.	450 ft.	450 ft.
Width—Canal.....	120 ft.	120 ft.	120 ft.	120 ft.	100 ft.	100 ft.	70 ft.	70 ft.	120 ft.	120 ft.	120 ft.
Locks—Number.....	None	2	2	2	2	2	2	2	2	2	2
Locks—Size.....	500' x 60'	500' x 60'	500' x 60'	500' x 60'	500' x 60'	500' x 60'	300' x 48'	300' x 48'	500' x 60'	500' x 60'	500' x 60'
Remarks.....	Run from water to water. No locks.	Canal at Baie Verte Level. 1 lock only.									
Estimated Cost—											
Excavation.....	45,570,570	39,092,950	19,394,120	17,437,780	8,685,260	7,933,620	9,103,410	8,429,760	32,490,720	24,033,010	21,668,000
Dykes.....	1,584,620	1,013,350	1,502,880	1,502,880	1,502,880	1,502,880	1,502,880	1,502,880	1,494,580	1,494,580	1,929,370
Locks.....											
Land—Berland Basin.....	6,705,400	6,950,260	6,705,400	4,715,050	5,711,250	4,078,220	4,533,150	3,053,010	4,938,470	3,880,750	6,728,510
Land—Baie Verte.....	2,700,980		2,700,980	2,700,010	2,700,010	2,300,010	1,773,580	1,725,960	2,300,580	2,700,980	2,700,980
Rock Dykes—Baie Verte.....	1,366,830		1,366,830	1,366,830	1,366,830	1,366,830	1,366,830	1,366,830	1,366,830	1,366,830	1,366,830
Railway Diversion and Bridge.....	673,890	673,890	673,890	673,890	573,890	573,890	543,890	543,890	648,790	648,790	659,290
Highway Diversion and Bridges.....	1,080,800	1,080,800	1,080,800	1,080,800	960,800	960,800	890,800	890,800	1,099,800	1,099,800	2,166,600
Water Supply.....	337,050	337,050	337,050	248,500	337,050	248,500	169,500	122,500	337,050	248,500	337,050
Miscellaneous.....	508,000	508,000	508,000	508,000	508,000	508,000	508,000	508,000	508,000	508,000	550,500
Eng. and Contingencies.....	6,177,120	6,164,750	4,283,050	3,779,290	2,744,050	2,434,250	2,500,960	2,274,850	5,097,780	4,498,760	4,763,870
Total.....	\$55,995,000	\$55,484,000	\$38,553,000	\$34,014,000	\$24,699,000	\$21,913,000	\$23,045,000	\$20,469,000	\$51,281,000	\$40,489,000	\$42,871,000
Capitalized Cost of operation of pumps.....											
Additional cost if Canal 200 feet wide.....			\$712,000	\$528,000	\$712,000	\$528,000	\$356,400	\$264,500	\$712,000	\$528,000	\$712,000
Additional cost for locks 839 feet x 80 feet.....			\$3,936,000	\$3,936,000							
			\$4,777,000	\$3,627,000							

## PART III

### EXTENT AND SCOPE OF COMMISSION'S INVESTIGATION

The Order in Council directing the inquiry and appointing the Commission was accompanied by a schedule of questions constituting the terms of reference, and outlining the extent and scope of the proposed investigation. The specific questions, 15 in number, were as follows:—

#### SCHEDULE "A"

1. Of what importance to the trade of Canada, and especially to the Maritime Provinces, would be the construction of the proposed canal?
2. What would be the class of trade which would pass through the proposed canal and how would it affect the Maritime Provinces, and Canada as a whole?
3. How would the construction of the proposed canal affect the trade of Prince Edward Island, and what would be the saving in distance, and probable saving in freight, respectively, between Prince Edward Island, Bay of Fundy, and the Gulf ports?
4. How would the construction of the proposed canal affect the Bay of Fundy ports, particularly in reference to the transportation of apples, gypsum and coal from these ports to Central Canada, and what would be the saving on freight rates?
5. What trade would be developed, through the construction of the proposed canal, from Central Canada to these ports, and what would be the saving on freight rates?
6. How would the proposed canal affect the trade of the North Coast of New Brunswick?
7. What would be the effect of the proposed canal upon the Gulf fisheries?
8. What would be the effect of the proposed canal upon Central Canada-West Indies trade?
9. What distance by water would be saved, through the construction of the proposed canal, between Montreal and the head waters of the Bay of Fundy, Montreal and the Annapolis Valley, and Montreal and Saint John, N.B.?
10. What are the possibilities of developing water power along the proposed canal?
11. What should be the depth of the proposed canal?
12. Would the proposed canal with a run from water to water be feasible; if not, how many locks would be required? What should be the width of the locks and what should be the length of the chambers between the locks?
13. What are the particular dangers, if any, to navigation in the Bay of Fundy which would affect the operation of ships through the proposed canal?
14. What class of vessels would be most likely to use the proposed canal?
15. What would be the probable cost of the proposed canal?

In pursuance of its inquiry, the Commission decided to go over the site of the suggested canal and also to visit the principal centres of trade and commerce in the Maritime Provinces. Due public notice of these contemplated sittings was given by newspaper advertisement, and by news items and editorial

references in the press. About two score Boards of Trade and Chambers of Commerce in New Brunswick, Nova Scotia and Prince Edward Island were supplied with a copy of the schedule of questions and invited to co-operate in placing before the Commission all available facts and arguments bearing upon the purpose of the inquiry. At the same time it was arranged that written submissions might be made by any public body, organization, or person who might not find it possible or convenient to be present at the public hearings. In view of parliamentary interest in the question all senators and members residing in the area covered by the inquiry were provided with a copy of the itinerary and of the schedule of questions and invited to attend the sittings. In addition, members of the several provincial governments were also notified, and the schedule of questions was also sent to extended lists of mercantile and manufacturing companies likely to be interested in the proposal as exporters or importers. The traffic vice-presidents of the two principal railways were also supplied with complete information as to the itinerary and the nature and extent of the information sought, and invited to make representations with respect to the possible effect of the proposed canal upon the traffic and revenues of the railways, if it was considered advisable or necessary to do so.

### WHAT THE COMMISSION FOUND

Notwithstanding rail and water connections presently enjoyed there is a section of Maritime opinion that considers the provision of a canal at Chignecto essential to a proper development and balance of interprovincial trade. This sentiment the Commission found to be especially pronounced in the Saint John and Bay of Fundy region which, to enter the St. Lawrence trade, must make the outside Atlantic passage around the Nova Scotia coast. The same feeling was found to be quite strongly held in the Province of Prince Edward Island, but for opposite reasons, viz: the importance of more direct connection with New England and West Indian markets, an advantage enjoyed by the ports of Saint John on the Fundy shore, and to Halifax on the southwest coast. The expectation in both cases is the anticipated benefits of cheaper transportation by water, as opposed to rail transport, or as opposed to the more circuitous and longer passage around the Atlantic coast.

Another note was also to be discerned from time to time during the course of the Commission's inquiry. The people of the Maritime Provinces, while justly proud of Canada's magnificent inland waterways, are inclined to consider that the development of the Great Lakes-St. Lawrence waterway has to a certain extent involved the neglect of similar possibilities of importance to Maritime interests. They recall that the Chignecto project was definitely and specifically recommended by the Canal Commission which appraised the canals and waterways of Canada immediately following Confederation, and, it should be added, before the Intercolonial and Prince Edward Island railways became realities.

With the construction of the proposed canal, it was urged that Saint John, as a distributing centre, would be afforded direct access to the ports on the north shore of New Brunswick, the Province of Prince Edward Island, and the Magdalen Islands, from which it is now cut off except by rail, or by excessive distance by water, at hazards involving heavy insurance and freight charges.

For Prince Edward Island it was claimed that with the canal in operation the Island Province would be as near to Boston as it now is to Sydney. The mines at Sydney now largely mechanized, no longer absorbed the surplus production of Island hay and grain which, it was urged, could, by means of the canal, find a ready market in the New England states.



While on the north shore of New Brunswick, the Commission was informed that a thousand feet of lumber on the Bay of Fundy shore was worth \$5 more than on the north shore, by reason of the fact that it was just that much nearer the United States market. Before the war, lumber was carried from Point du Chene, on the north shore, to Boston at \$3.90 a thousand feet, compared with with \$9.20 more recently. It was urged that with the provision of the canal it would be possible to ship long lumber—the major portion of which, for New Brunswick, is manufactured on the north shore—for \$3.50, instead of \$9, and it was claimed that the margin would make possible the survival of the north shore lumber industry. It would, it was also claimed, make possible the exploitation of unlimited supplies of pulpwood in the Miramichi region, now without outlet at prevailing costs of production and marketing.

It was contended that the port of Saint John could look forward to a greatly enhanced trade if the canal were provided. Liners plying between Montreal and the West Indies during the summer season, which now pass out through the Gut of Canso, thus avoiding the outer passage by way of Cabot Strait, could use the Chignecto Canal and the sheltered Fundy waters, while freight and passenger vessels from the West Indies could save time and gain mileage by making Saint John a port of call and then proceeding through the Bay of Fundy to the St. Lawrence ports. It was held that great stimulus to trade would result, while the greater use of the port of Saint John by steamers would be of benefit to the large modern dry dock which has been established at that point.

Maritime opinion, at any rate that section located close to the site of the proposed Chignecto Canal, was inclined to link up the Chignecto proposal with the projected deep-water development of the St. Lawrence. At Amherst, Senator Hance J. Logan, Chairman of the Chignecto Canal Committee of the local Board of Trade, expressed the belief that the United States should be asked to contribute a share of the cost of the Chignecto work because of the benefit it would be to United States shippers in the middle-west desirous of reaching United States Atlantic ports through the Great Lakes-St. Lawrence waterway.

## OPPOSING VIEWS OF SHIPPING COMPANIES

At Saint John, H. B. Galt, general manager of the Eastern Canada Coastal Steamship Company, expressed the opinion that provision of the Chignecto Canal would be "a wonderful boon to the company's business."

The big thing for us would be to open up a route between Saint John and Prince Edward Island. Ours is a more or less selfish standpoint because what business would come to Saint John probably would be taken away from some other part in the Maritime Provinces, but of course we are looking after our own interests here. There is also the possibility that we could open up a trade route through the St. Lawrence River, which it is impossible to do at the present time. Going through this canal we could cut off so much of the distance involved in getting around Nova Scotia.

This company owns 26 small coastal boats, the largest 866 tons. They operate out of Saint John to Bay of Fundy ports and to Yarmouth and Grand Manan, and out of Halifax northerly to Cape Breton ports and around through the Strait of Canso, practically encircling the Maritime Provinces. They have 10 boats out of the St. Lawrence, but do not reach Montreal. With the Chignecto Canal affording a shorter route they would expect to operate to Montreal. On the matter of insurance this witness stated that they paid 6 to 7 per cent out of the Bay of Fundy ports and 10 per cent out of Halifax. After November 15 the rate out of Halifax went up, but the Bay of Fundy rate did not.

By contrast may be cited the views of the managing owner of the Interprovincial Steamship Lines, Limited, Mr. Frank K. Warren, appearing before the Commission at Halifax. This company operates four steamers. Its eastern terminal point is Saint John, its western Port Arthur and Fort William. These boats call at Quebec, Montreal, Toronto and Hamilton on the way in. The bulk of the northbound cargo consists of refined sugar, which is shipped by the Atlantic Sugar Refinery, Saint John, and the Acadia Sugar Refinery, Halifax. On the southbound voyages the boats carry flour and other grain products from Fort William, which they land at Chatham, N.B., Charlottetown, Sydney, Halifax, Lunenburg, Yarmouth and Saint John. They do not always call at each of these ports. Shippers are afforded a selection of two, sometimes three, ports on each voyage where they may want these steamers to call. In 1931 they carried over 40,000 tons of sugar from Saint John and Halifax to the various ports mentioned, and brought back 30,000 tons of flour and feed from lake head to Maritime ports.

"So far as the proposed canal across the Chignecto Isthmus is concerned," Mr. Warren stated to the Commission, "it would be of no advantage whatever to us, because, in order to get our cargoes we have to call at a range of ports. There is no full cargo business in Bay of Fundy ports, and the only way in which we are able to operate is by taking cargo for a range of ports."

Another witness, Mr. D. R. Turnbull, managing director of the Acadia Sugar Refinery, Halifax, considered the construction of the proposed canal as likely to injuriously affect the Interprovincial Steamship Lines, already giving Maritime Province shippers excellent service to Canadian interior points at moderate rates. Such a canal might create destructive competition in trade, of which sufficient had already been seen in Canada of late years.

As far as the canal is concerned, I cannot see that any benefit is going to be gained for the Atlantic coast of Nova Scotia nor for Halifax; and if we are not going to gain anything, we may on the other hand lose something. It looks to me as if the northern part of New Brunswick, that is the Baie Verte shore, is very well supplied with shipping from Montreal and Quebec. The competition in the open season from ships coming down from Montreal and Quebec is quite injurious to Halifax; that is, it is very keen competition, and I think New Brunswick suffers to a certain extent as well as the Atlantic coast of Nova Scotia.

Therefore, I do not feel that the canal in itself is going to do the south coast of Nova Scotia any good, and very little good to the northern part of New Brunswick, and I think, as Col. Montgomerie has well put it, that it is something that is going to be held up against Nova Scotia and the Maritime Provinces with respect to the capital cost. We shall be told, "We have done this for you." In fact, the proposed canal is a local thing in comparison with our transportation requirements by rail. The canal would cut Nova Scotia off from the Island, it would do injury to these big transportation companies which are having such a hard time and are likely to continue so until there is a general improvement. Therefore, I desire to register my protest against the construction of the proposed canal.

Mr. Turnbull is a past president of the Halifax Board of Trade and president of the Maritime Freight Commission, which in recent years has given a great deal of time to investigating and studying the freight problem of the Maritime Provinces.

## NAVIGATION IN THE BAY OF FUNDY

In the course of its tour the Commission was tendered much information and advice with respect to conditions of navigation in the Bay of Fundy by ship captains of wide experience and extended acquaintance with these and other waters. Among those appearing before the Commission on this particular aspect of the problem were Capt. A. B. Taylor and A. H. Wetmore, of Saint John; Captain R. V. Bennett, and Captain L. Tower, as well as Senator F. B. Black, of Sackville; Capt. J. C. Walters and Capt. George Newcombe, of Amherst; Capt. Carter, Halifax; Capt. J. E. Kenny and Capt. Ladd, Yarmouth; Capt. S. L. Merriam, Capt. C. E. Read, Capt. J. C. Steeves, of Moncton, and others.

Advocates of the project, some of them with life-long experience in Fundy waters, could see no particular difficulty in the navigation of the Bay at any season. It was admitted that the Bay was subject to unusually strong tides, especially in the fall of the year, but with full-powered vessels and modern aids to navigation this would not present any particular difficulty. It was stated that, unlike the southeast coast of Nova Scotia, the Bay of Fundy was not greatly subject to fog, and such fog as did develop was, in the summer at least, dissipated by noon by heat radiation. From the standpoint of fog, it was claimed that navigation conditions were quite as good as those obtaining at the entrance to the Manchester Ship Canal, and better than those to be found at the entrance to the Kiel Canal from the North Sea. In any event, fog would be robbed of its terror by the application of wireless direction-finding devices. On the Baie Verte, or Gulf of St. Lawrence side of the Isthmus, there was stated to be very little fog, and that only when there was an east wind.

Even under present somewhat limited aids and navigation improvements, it was noted that vessels of 5,000 tons and drawing from 20 to 25 feet of water, went into the Bay of Fundy to load gypsum at Windsor, N.S., and Hillsborough, N.B. Vessel men familiar with conditions had no hesitation in stating that they preferred navigation of the Bay of Fundy to the navigation of the waters off the Nova Scotian Atlantic coast with its longer distances and greater hazards to life and property.

On the other hand, the Commission was informed at Halifax that records extending over a period of years indicated an average of 40 days of fog per annum around the southeast coast, and from 58 to 61 days in the Bay of Fundy. It was also pointed out that vessels plying to Fundy ports, such as Windsor, could only enter during two or three hours on a tide.

Another witness said that owners were much averse to having their vessels load aground. Gypsum-carrying steamers trading to Fundy points were specially constructed because of that necessity, and special cradles were provided at the wharves to handle them. It was stated that British owners as a rule would not charter their vessels anywhere unless they would always lie afloat. That was declared to be probably one reason why the apple trade from Bay of Fundy ports was being carried on altogether by Norwegian and other foreign tonnage. It was generally acknowledged by all navigators that the more open the sea the better.

## TIME PERCENTAGE OF FOG

In the matter of fog the Commission has had access to the records of the Department of Marine and Fisheries, over a period of about 20 years, from which there has been compiled a plan (reproduced with this report) showing in percentage of total time at various eastern Canadian points, the duration of fog from April to November, inclusive, and, in some cases, such as the Belle Isle area, from May to November, inclusive; also the average percentage of



fog during the navigation season at certain inland points on the Great Lakes navigation system. In view of their official character, these records may be accepted as both accurate and unprejudiced. They show an almost negligible period of fog along Canada's great inland waterway, from Sault Ste. Marie to Three Rivers, Quebec, and fog of varying intensity and duration in the lower St. Lawrence. That area of the Gulf of St. Lawrence embraced by the Gaspé, Baie de Chaleur and Prince Edward Island regions shows a relatively light visitation, while the average of the Belle Isle section to the north is found to be distinctly better than either the Bay of Fundy or the southeast coast of Nova Scotia. By contrast the stations reporting in these latter two areas would seem to leave much to be desired, from the standpoint of fog, in comparison with the St. Lawrence-Great Lakes route, and as between the Bay of Fundy itself and the Nova Scotian Atlantic shore there would appear to be very little difference in the time percentage of fog during the season of summer navigation, though, as will be seen from the map showing the percentages of the two areas, Bay of Fundy interior points undoubtedly enjoy a slight advantage, as will be seen from the following statement of fog percentages based on two decades of observation and record:—

<i>Nova Scotia Atlantic Coast</i> (Including Cape Breton Island)		<i>Bay of Fundy Points</i>	
	Per cent		Per cent
Cape North .....	8·7	Seal Island .....	23·8
Flint Island .....	14·2	Big Duck Island .....	22·8
Louisburg .....	23·7	<i>Nova Scotia Shore—</i>	
Cranberry Island .....	18·0	Digby Gut .....	7·3
Beaver Island .....	22·7	Parrsboro .....	10·6
Chebucto Head .....	18·8	Cape d'Or .....	14·4
Cross Island .....	18·7	Apple River .....	17·9
Cape Sable .....	30·2	<i>New Brunswick Shore—</i>	
Seal Island .....	22·5	Grindstone Island .....	14·8
Cape Fourchu .....	19·6	Cape Enrage .....	22·4
Lurher Shoal Lightship .....	19·5	Quaco .....	16·4
Brier Island .....	21·7	Cape Spencer .....	21·3

## CATTLE RAISING AND MILL FEEDS

Emphasis was laid by certain of the witnesses upon the benefit that would accrue to the dairying and export beef trade of the Maritime Provinces. It was stated to the Commission that up to 1885 Westmoreland and Cumberland counties were the greatest beef export points in Canada. In those days, as many as 4,000 beef steers had been shipped from Sackville in one year to the British markets by way of Halifax and Saint John. It was also an excellent dairying country. The Tantramar and Missiguash marshes, 20,000 acres in extent, were capable of producing an average of 2½ tons of hay per acre per year, without fertilization. The view was expressed that as Western Canada goes from wheat-growing into mixed farming, so the Maritimes would go into beef-growing. It enjoyed the advantage of relatively close proximity to the British market, but the difficulty had been the cost to the farmer of the bran, middlings, shorts and mixed feeds necessary to successful cattle-raising. With the canal built, Senator Black, of Sackville, N.B., looked forward to the establishment of a large flour-milling industry at Saint John, the carriage of grain without transhipment from the head of the lakes to Saint John, via Chignecto, the milling of grain cargoes at that point, and the disposal of the by-products referred to at a saving to the farmers of \$7.00 to \$8.00 a ton over present prices.

W. W. Baird, Superintendent of the Dominion Experimental Farm, at Nappan, N.S., informed the Commission that the cost of mill feeds was so high, due to the long haul and high freight charges by rail, that 32 per cent of the proceeds of the total sales of milk and cream, on a survey of 24 repre-

sentative farms, had been found to go for feed alone, and feed had been found to constitute 60 per cent of the total cost of production. Mr. Baird said:

You may ask why we do not produce our own feeds. We produce in Nova Scotia alone something over 4,000,000 bushels of grain, but we require approximately 9,000,000 bushels to provide the amount our livestock requires, if properly fed. We require, in addition to the regular grain ration, a very large tonnage of mill feeds, such as bran, shorts, oil cake, cotton seed, etc. To-day we bring into Nova Scotia something over 3,600 cars of feed, which represents 90,000 tons. Of these 3,600 cars, 2,500 come from the head of the Great Lakes at a cost of the prevailing market price plus a freight charge of approximately \$11.40 per ton. It is our opinion that if these feeds could be brought direct from the head of the Great Lakes to the various ports in Nova Scotia at freight charges of from a half to two-thirds of the present charge per ton, it would not only affect a very marked saving to the farmers of these provinces, but it would be the means of removing one of the greatest handicaps to the development of our dairy industry.

We are of the opinion that the Chignecto Canal would help solve this problem in providing a waterway that would enable vessels to leave the head of the Great Lakes and enter ports in almost any part of Nova Scotia, and in this way give us at least a one-third reduction in freight rates, if not a half, and likewise save mileage. A one-third reduction in freight charges means approximately \$4 per ton, or a net saving of \$250,000 annually to the farmers of Nova Scotia alone. Cheaper feeds mean better livestock, and better livestock makes for a more progressive agricultural industry.

On the question of the establishment of flour mills in the Maritime Provinces for the sake of the mill-feeds involved, Col. Alex. Montgomerie, Chairman of the Chignecto Canal Committee of the Halifax Board of Trade, reminded the Commission that in 1930 the government of the Province of Nova Scotia had appointed a Royal Commission to inquire into the subject. The government, he said, was very anxious to do everything that could be done to get flour mills established in the province. That Commission made quite an exhaustive report from which Col. Montgomerie read the following conclusion:—

The ratio of production of mill feeds as compared to flour is approximately 70 pounds of mill feeds produced from 1 barrel of flour. Presuming that a mill was located in Nova Scotia and was able to command the total flour market of the Maritime Provinces, estimated at 1,000,000 barrels per annum, and in addition to that was able to ship an equal quantity for export, making a total production of 2,000,000 barrels per year, the total mill feed production from the 2,000,000 barrels would only be approximately 70,000 tons of mill feed per year. In other words, even with the 2,000,000-barrel production of flour, half of which would have to be exported, not enough mill feeds would have been produced by the local mill to even supply the Nova Scotia feed market, estimated at 110,000 tons, let alone the needs of the other Maritime Provinces.

## THE CANAL AND THE FISH TRADE

At Saint John it was stated by A. N. McLean, President of Connors Bros., Black's Harbour, N.B., that along the coast of New Brunswick there were hundreds of thousands of tons of surplus fish awaiting a market. That surplus greatly exceeded anything for which markets had yet been found. It was claimed that the more fish that were taken out of those waters the more

fish would be developed for many years to come. Central Canada and the West were regarded as the proper market for those fish. The railways are admitted to be giving excellent service with splendid facilities for distribution, but at rates which could not compare with water rates. In consequence, it was found that in many cases fish from Europe could be exported to Central and Western Canada about as cheaply, and sometimes more cheaply, than could fish from the Maritimes. Canned fish could be shipped by rail to advantage, but it was urged that a saving could undoubtedly be effected by direct shipment by water to Montreal, Toronto and Fort William through the proposed canal, and the saving involved would mean a good deal to the Fundy Fisheries. There was a great future, it was maintained, for the fish business of the Maritimes. Those connected with the industry had every confidence in it. It was largely a case of getting markets and being able to compete with other exporters.

At Charlottetown, W. F. Tidmarsh, chairman of the Fishery Committee of the local Board of Trade, addressed the Commission with respect to Prince Edward Island Fisheries, on whose behalf it was urged that the canal would open an entirely new avenue of commerce. It would bring the southern markets 230 miles nearer than they are at present. It would afford cheap water-borne freight, and with more satisfactory trade relations with the United States, which it was hoped would eventualize in the near future, could not fail to give distinct impetus to the development of the natural products of the Island.

At Moncton, A. L. Comeau, representing the fisheries of the north shore of New Brunswick, attributed the loss of population in the Maritime Provinces to the decline of the fisheries. After 25 years of daily contact with the industry, this witness held that, while there had been some progress along certain lines, he failed to see where the fisheries have been deriving benefit from what had been done on their behalf. If for the last 15 years there had been, as claimed, marked progress in the fishing industry, why was it that fishermen were getting less for their fish to-day than they were 15 years ago? It sounded ridiculous, but it seemed the more the people were educated to eat fish, the less the fishermen were getting for their catch. Two years ago the prices paid on Boston wharf for cod, haddock and other fish averaged 6 cents a pound. Reports from Ottawa gave the price received for Canadian fish as averaging one cent a pound. The duty on fish entering the United States is 3 cents a pound; which led this witness to ask whether Canadian fishermen had not been backward in grasping an opportunity. He believed that if the canal were built, it would bring about a great change resulting in immense benefit to the fisheries.

At Newcastle, W. Stafford Anderson, M.L.A., stated that as from 75 to 90 per cent of Maritime fresh fish found a market in the Eastern States, Bay of Fundy fishermen had an advantage over those on the north shore and on Prince Edward Island. Shipment of fresh fish by rail was difficult and expensive. If the Chignecto Canal were built they could expect oil-burning boats to collect the fish, keep them fresh in chilled chambers, and deliver them on the Boston and New York markets in better condition and at a lower price to the consumer, or a greater price to the producer.

At Halifax the Commission had the benefit of the views of A. H. Whitman, interested in the Gaspé fisheries, and whose chief markets were in Brazil, and in Europe, and incidentally, the West Indies. The latter was a very large market so far as Canadian fisheries generally were concerned. Up to a few years ago, these fish were transferred by sailing vessels, but now the trade was done almost entirely by steamer. Mr. Whitman was of opinion that there would be no advantage in a sailing vessel loaded with fish for South America



using the Chignecto Canal, if constructed, as the proper route required them to go away across the Atlantic to the Windward Islands, there to pick up the trade winds and go south. The prospect of fish for South America going through the canal was described as an absolute impossibility, except in the case of a captain not knowing the way to the southern hemisphere.

At Halifax a letter from H. G. Connor, Vice-President and managing director of the National Fish Company, Limited, to the secretary of the Board of Trade, was read to the Commission, to this effect:—

It is our opinion that the construction of a canal across the Isthmus of Chignecto will have no effect favourable or unfavourable, upon the development of the fisheries of the Bay of Fundy, nor upon the transport of the products of said fisheries to the markets of Central Canada.

This company was stated to be largely interested in the sending of fish to Central Canada. It has a branch at Digby, on the Bay of Fundy, and the opinion was said to be based on Mr. Connor's knowledge of conditions there.

### SALT AND NATIVE STONE

In the course of the itinerary of the Commission various witnesses urged the construction of the canal as a means of developing to greater capacity certain deposits of salt, sandstone, grindstone, granite, limestone and gravel which, because of their location, difficulties and expense in the way of handling by rail and by present water routes—and the necessity to meet close competition—were not now being worked to the extent that they might be.

At New Glasgow, A. R. Chambers, general manager of the Malagash Salt Company, dwelt on the importance of the proposed canal to the fishing villages, whose salt requirements ranged from a hundred to ten thousand tons of salt a year. To the shore fisheries, facing very great difficulties at the present time, a supply of cheap salt was an all-important factor, with salt fish selling as low as \$2.50 to \$3 a quintal and, in some cases, requiring thirty-five cents worth of salt to cure that amount of fish. The double handling of salt from a larger to a smaller vessel adds from \$1.50 to \$2.50 a ton to the price, adding from ten to fifteen cents to the cost of a quintal of codfish. The advantage of the canal would be that schooners could load salt at Malagash pier and move it direct to the point of consumption, with consequent saving in cost. Senator Black also called the attention of the Commission to what he stated to be the largest known deposit of salt in the world, at Memramcook, for which a great future was anticipated, salt being one of the chief ingredients of most commercial chemicals. The Malagash deposit is located on the Nova Scotia shore north of the proposed canal and the Memramcook deposit is located in New Brunswick at a point already accessible to Bay of Fundy fisheries should the deposit be developed on a commercial scale.

Senator Black referred to an important trade in red sandstone with interior points which had flourished before the Great War. He claimed that the finest red sandstone quarries in Canada were located at Sackville, and were now largely unworked because of high freight charges by rail. In consequence, building stone can be brought in from the United States across the Great Lakes and through the canals so cheaply that stone from Sackville, Wood Point, Dorchester and Rockland could no longer compete, and an industry which formerly employed five hundred men was now practically non-existent. Senator Black referred also to the grindstone deposits at Maringouin, and also on the Dorchester River. The canal might mean much for that industry in the movement of special grindstones used for pulp and paper mills.

At Saint John, C. W. McGratton directed attention to immense deposits of coloured granite at St. George, N.B. This product is in demand throughout Canada for monument purposes. The industry is protected by a forty per cent duty, notwithstanding which the Swedish granite is said to be able to compete with the New Brunswick stone at Canadian interior points. This was rendered possible by the fact that the freight rates from Sweden and from St. George to Toronto were about the same, while the fact that wages paid at St. George were \$5.00 and in Sweden \$1.50 a day made competition possible. The construction of the canal would make it possible to ship by water; so far all shipments from these quarries have been by rail.

J. Sutton Clark, L'Etang Harbour, informed the Commission that he had there one hundred million tons of limestone in sight, of high calcium content, quick slacking lime, most suitable for building and also for the manufacture of sulphite pulp. The lowest freight rate around Nova Scotia by water to Montreal was \$2.50, and by rail \$4.60. He would expect a \$1.50 rate by water to Montreal if the canal were put through. He estimated that a saving in distance of six hundred miles would be effected.

At Moncton Mayor Blakney suggested the possibility of the canal rendering accessible to Prince Edward Island the large tidal deposits of gravel at Waterside, in Albert County, at Sand River, in Cumberland County, and at Martin Head, in Saint John County. Prince Edward Island, being practically without native gravel, all road-making material had to be imported. A canal connecting the Bay of Fundy and Northumberland Strait would greatly lessen the cost of road construction in Prince Edward Island. Prince Edward Island was likewise without native building stone.

### THE CUMBERLAND COAL AREAS

Randall Emerson, managing director of the Fundy Coal Company, Limited, informed the Commission that the resources of the coal areas in the western section of Cumberland County were approximately 50,000,000 tons, 16,000,000 of which were located in the Fundy area. The market for Maritime Province coals had declined by more than 300,000 tons during the last ten years owing to importation of foreign coal and lessened demands of the railways. Unless outside markets could be secured it was only a matter of a short time before most of the mines in Cumberland County would be forced to close. The freight rate by rail to the Province of Quebec, \$3.40 a ton, was much too high to enable the Cumberland product to compete in the markets of that province handling foreign coals. The canal would enable the Cumberland product to enter the coastal ports of Prince Edward Island, the northern ports of New Brunswick, and all the ports along the St. Lawrence River. An additional demand of 100,000 tons during the navigation season would mean 300 additional miners and \$250,000 in wages alone, while the pit prop requirements would give work to an additional number of lumbermen. It would assist the shipping industry also by bringing a number of schooners into the coal-carrying trade.

At Halifax, I. W. Cameron, manager of the Dominion Coal Company, one of the subsidiaries of the Dominion Steel and Coal Corporation, advised the Commission that his company moved, in a normal year, about 2,500,000 tons of coal through the St. Lawrence River. They had a capacity for a much larger tonnage if the business were available. Mr. Cameron said that

Practically the whole of this tonnage moves from the Sydneys, and, while as a matter of fact we have the largest operations in Cumberland County, personally I cannot see how, even with the canal, we could compete with the Sydney district for such additional business in the St. Lawrence as might be available.

At Pictou, Colonel J. Wilson Macdonald, Town Solicitor, said:—

With regard to the question of coal, we desire to point out that at present the markets of Prince Edward Island, Northern New Brunswick and Quebec are already amply supplied with coal from Pictou County, Inverness County, and the various large mines in Cape Breton County. These can send their products direct by water without the aid of a canal, and they are at present unable to dispose of sufficient coal in these markets to keep their miners at work. To spend the country's money to bring more coal mines into competition with them would hardly seem to be justifiable.

### THE GYPSUM INDUSTRY

With respect to gypsum, Senator Black spoke of the immense deposits at Windsor, N.S., and Hillsborough, N.B., on Bay of Fundy waters, which could not enter the St. Lawrence markets because it had to be carried 700 miles further than if it went through the proposed canal. Seven hundred miles was equivalent to two days' sailing by an ordinary tramp steamer costing about a thousand dollars a day to operate, including maintenance, insurance, depreciation and interest on investment. Therefore, the saving of \$2,000 on a cargo from Hillsborough or Windsor to Montreal or Toronto would be sufficient to put into those markets products which at present go entirely to the United States or to European markets.

Honourable Albert Parsons, Minister without portfolio in the Nova Scotia Government, said the great market for Nova Scotia gypsum was in Upper Canada. To see the large steamers leaving Minas Basin one would think Hants County was supplying the whole American trade, whereas they were not supplying one-tenth of it. They would have more of the United States trade if they had the canal. At present that trade is confined to the Atlantic seaboard. The gypsum deposit in Hants County consisted of a range of mountains fifty miles long and about a mile wide. It was being worked to a depth of between 300 and 400 feet. Although during the forty years Mr. Parsons had been in the business shipments had averaged from 1,000 to 100,000 tons a year they had only advanced five hundred feet into the mountain.

It was claimed that the canal should prove useful in the shipment of manufactured as well as raw gypsum. The Albert Manufacturing Company, a branch of the Canadian Gypsum Company, Limited, located at Hillsborough, N.B., ship between 25,000 and 50,000 tons of finished gypsum products into Montreal and the surrounding areas, as well as further west to Toronto. It was stated that a moderate increase in this tonnage might be expected as the result of a better freight rate by way of the proposed canal.

At Pictou, Colonel Macdonald called attention to the fact that there were large deposits of gypsum in Antigonish, Inverness, and other counties in Cape Breton, on the St. Lawrence side of the proposed canal and contiguous to the St. Lawrence and Upper Canada trade by boat which, for want of markets, have not yet been fully developed.

Representations were made to the Commission with respect to several other minerals, including the products of the Manganese Mines, Limited, Turtle Creek, Albert County, N.B., the Bathurst Iron Mine, Bathurst, N.B., and an as yet undeveloped copper property near St. Stephen, N.B. Something was said also as to the effect of the canal upon the exploitation of a deposit of sphagnum moss in the same neighbourhood. It was stated that at the present time thousands of tons of this moss are imported. It is used in poultry houses and stables, on golf courses, and for horticultural purposes, and that there should be a considerable market for the product in Montreal, Toronto and Western Canada.

## NOVA SCOTIA APPLES

Two products of great importance to the Maritime Provinces are apples and potatoes. It was stated to the Commission by Senator Logan that the Annapolis and Cornwallis valleys of Nova Scotia produce about a million and a half barrels of apples per year and could produce probably five millions if there were a market. To-day the only market is the open, competitive market of Great Britain. If the Chignecto Canal were constructed, it would bring the Annapolis Valley five or six hundred miles nearer by water to Montreal than at present, and coasting vessels could be used. In Montreal there is a market of a million people. It was represented to the Commission that a saving of probably 20 cents a barrel could be effected by the more advantageous route via the canal.

J. L. Ilsley, M.P., placed the production of apples by Nova Scotia at from one to two million barrels a year. The production was stated to be larger than that of any other province, and is frequently greater than that of all the rest of Canada. On an average, at least 80 per cent of the marketable apples were sold outside of Canada, most of them in the United Kingdom and Continental Europe. The remaining 20 per cent were sold in Maritime Provinces and in the Province of Quebec.

Of the apples shipped abroad about 200,000 barrels per season had, in several recent years, been shipped from Port Williams, a small place near the mouth of the Cornwallis river, where it flows into Minas Basin, an extension of the Bay of Fundy. This port, located about five miles from the town of Kentville, was very advantageously situated, as a great quantity of apples could be trucked into it at low cost. Formerly the business referred to had gone out through Halifax, the apples being shipped to that port via the Dominion Atlantic Railway.

Assuming that shippers will continue to use Port Williams, and perhaps also Kingsport, Hantsport and Windsor, it was suggested that a day could be saved in transit via Chignecto by contrast with the present route extending around the western end of Nova Scotia.

Apples sent to St. Lawrence river ports accounted for quite a large part of the 20 per cent sold within Canada. Nearly all of those apples go to Quebec and Montreal. Some are sent after the St. Lawrence freezes up, but the greater part go forward during the season of navigation. It was quite possible, Mr. Ilsley thought, that water shipments before St. Lawrence navigation ended would be feasible through the proposed canal. The movement to-day was by rail, but a shorter water route might result in water shipments with considerable saving to shippers. The canal route would also be useful for shipments to Prince Edward Island and Cape Breton, also to Newfoundland.

## POTATO PRODUCTION

At Charlottetown, Nelson Rattenbury, who has made a close study of the potato-growing industry in the Maritime Provinces, informed the Commission that in the five-year period, 1910-1914, previous to the provision of a train-ferry service between Prince Edward Island and the mainland, the average yearly production of potatoes on Prince Edward Island was 6,000,000 bushels, the average price 29 cents per bushel, and the total value \$1,691,000. The average yearly crop in Nova Scotia, during the same period, was 6,250,000 bushels, the average price 48 cents per bushel, and the total value \$3,000,000. This was taken to indicate that, previous to the advent of the train-ferry, the potato crop of the Island had been reduced in value each year by \$1,000,000 as compared with the Nova Scotia crop.



The Prince Edward Island potato crop of 1930 amounted to 9,250,000 bushels, and the total value to \$3,617,000, an increase of \$2,000,000 over the 1910-1914 period. The New Brunswick crop for 1930 was the same as that of Prince Edward Island both in extent and value.

Mr. Rattenbury regarded it as satisfactory that a train-ferry service had so far improved transportation conditions that Island farmers now realize as much for their potatoes as their mainland neighbours do. But for such bulky and heavy products as potatoes, turnips and other root crops, rail transportation was much too costly. To Montreal it was 18 cents a bushel, to Boston 30¼-30½ cents, to New York 40-43 cents. These rail rates were contrasted with the ocean rates of from 4 to 7½ cents per bushel on grain to Liverpool. He estimated that 8 cents a bushel on the cost of moving the potato and turnip exports of Prince Edward Island might be saved by water transport through the canal. This, applied to the movement of the 1930 crop, would have meant a saving of \$626,591 on Island shipments. It was true that, at present, there was no water movement in these commodities from Prince Edward Island to Montreal, though there are certain steamship connections. With liners calling regularly and using the canal in both directions it was felt that a steady trade could be established which would be of great advantage to Prince Edward Island agriculture.

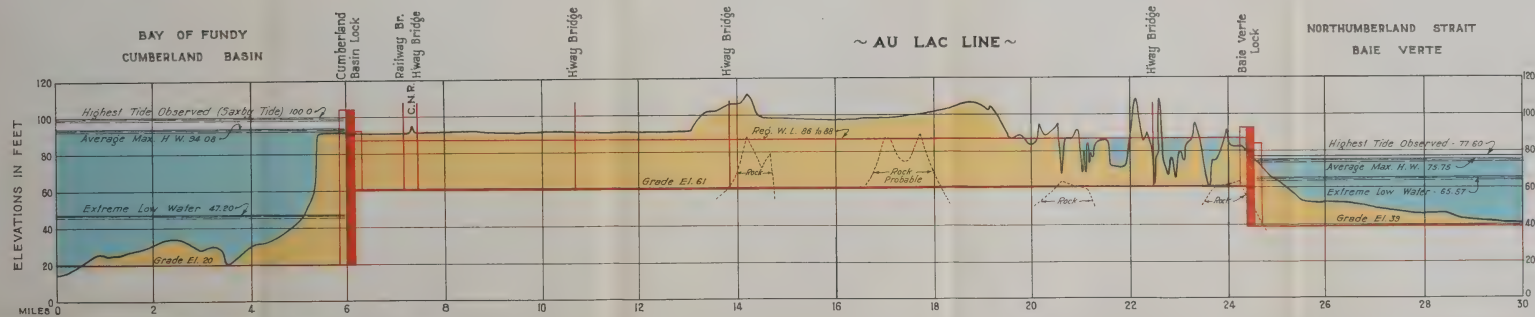
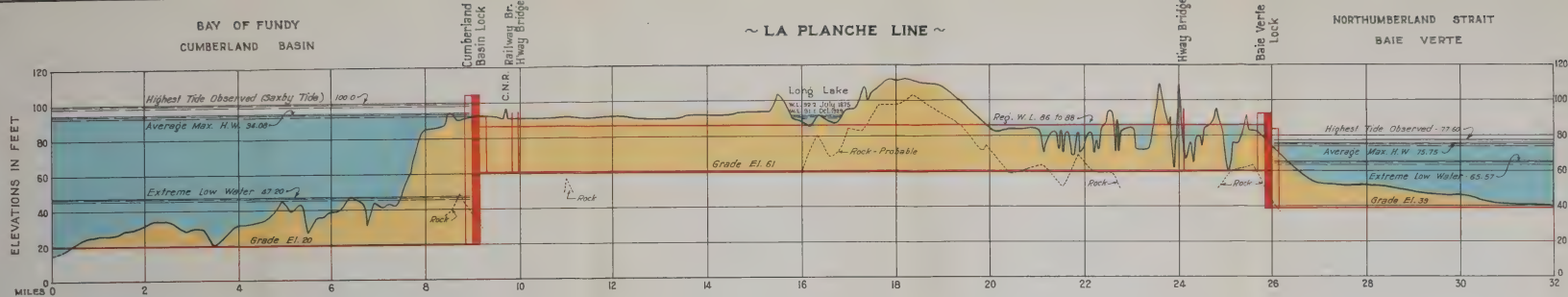
A copy of the recorded proceedings, of which the foregoing is a summary, will be filed with the Commission's report.











# ISTHMUS OF CHIGNECTO

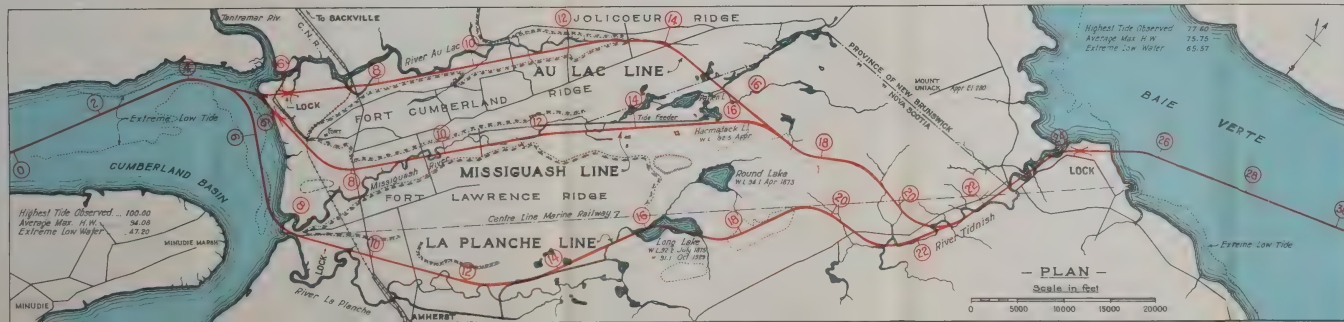
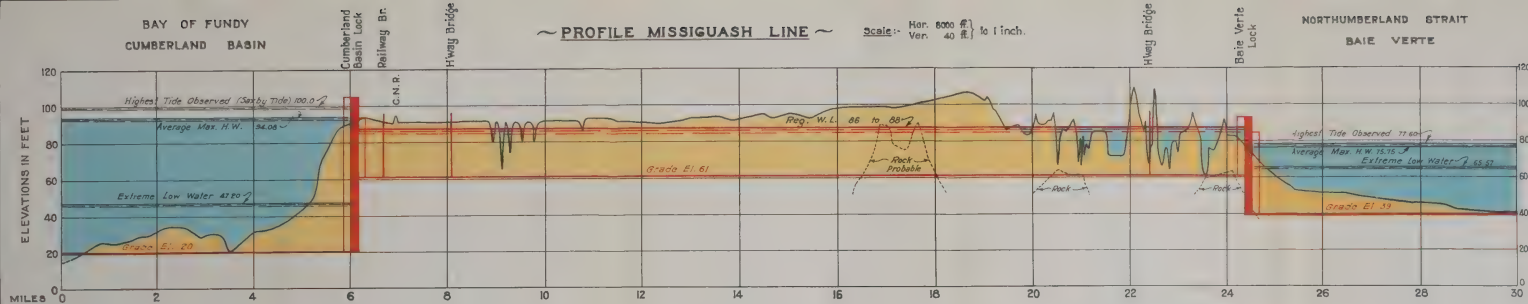
## PROFILE

### ALTERNATIVE ROUTES FOR PROPOSED CANAL

Scale: { Hor. 8000 ft. } to 1 inch.  
{ Ver. 40 ft. }

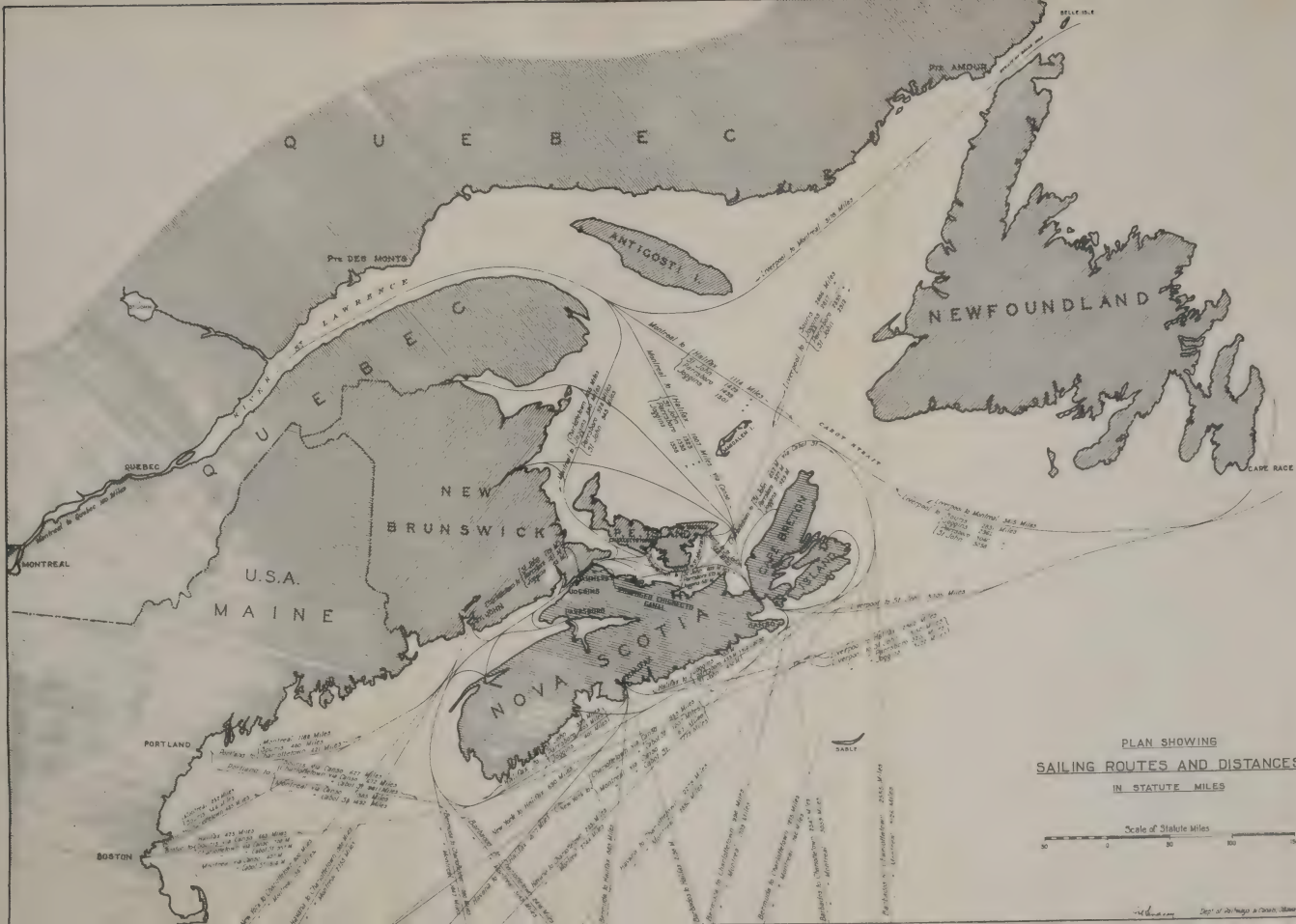
Note: All Elevations refer to Saxby Tide Datum used in 1873.

Department of Railways & Canals.  
Ottawa, December 27-1932.



Note:-- All Elevations refer to Saxby Tide Datum used in 1873.

Department of Railways & Canals,  
Ottawa, December 27-1932.



PLAN SHOWING  
SAILING ROUTES AND DISTANCES  
IN STATUTE MILES

Scale of Statute Miles  
0 20 40 60 80 100





3 plane  
(profile)  
in pocket







